

(1) producing a halogen-terminated vinyl polymer by atom transfer radical polymerization and

(2) converting the terminal halogen of said polymer to a phenol group-containing substituent group.

5. (Amended) The heat-curable composition according to Claim 1 wherein the (A) component vinyl polymer has its main chain produced by polymerizing a (meth) acrylic monomer.

8. (Amended) The heat-curable composition according to Claim 1 wherein the (A) component vinyl polymer has its main chain produced by polymerizing a styrenic monomer.

9. (Amended) The heat-curable composition according to Claim 1 wherein the (A) component vinyl polymer has a ratio (M_w/M_n) of weight average molecular weight (M_w) and number average molecular weight (M_n) as measured by gel permeation chromatography of less than 1.8.

10. (Amended) The heat curable composition according to Claim 1 wherein the (A) component vinyl polymer has a number average molecular weight of 500 to 100,000.

11. (Amended) A shaped article as obtainable by curing the heat-curable composition according to Claim 1.

14. (Amended) The polymer according to Claim 12 wherein the (A) component vinyl polymer has its main chain produced by the atom transfer radical polymerization of a vinyl monomer.

RECEIVED
APR 15 2004
TC 1700

15. (Amended) The polymer according to Claim 12

wherein the (A) component vinyl polymer is obtainable by the procedure comprising

(1) producing a halogen-terminated vinyl polymer by atom transfer radical polymerization and

(2) converting the terminal halogen of said polymer to a phenol group-containing substituent group.

16. (Amended) The polymer according to Claim 12

wherein the (A) component vinyl polymer has its main chain produced by polymerizing a (meth) acrylic monomer.

19. (Amended) The polymer according to Claim 12

wherein the (A) component vinyl polymer has its main chain produced by polymerizing a styrenic monomer.

20. (Amended) The polymer according to Claim 12

wherein the (A) component vinyl polymer has a ratio (M_w/M_n) of weight average molecular weight (M_w) and number average molecular weight (M_n) as measured by gel permeation chromatography of less than 1.8.

21. (Amended) The polymer according to Claim 12

wherein the (A) component vinyl polymer has a number average molecular weight of 500 to 100,000.

22. (Amended) The polymer according to Claim 12

RECEIVED
MAR 15 2004
TC 1700

CLAIMS

1. A heat-curable composition comprising
(A) a vinyl polymer having at least one phenol group at
5 the main chain terminus
and (B) a phenolic resin.
2. The heat-curable composition according to Claim 1
wherein the (A) component vinyl polymer has its main
10 chain produced by the living radical polymerization of a vinyl
monomer.
3. The heat-curable composition according to Claim 1
or 2
15 wherein the (A) component vinyl polymer has its main
chain produced by the atom transfer radical polymerization of
a vinyl monomer.
4. The heat-curable composition according to any of
20 Claims 1 to 3
wherein the (A) component vinyl polymer is obtainable by
the procedure comprising
(1) producing a halogen-terminated vinyl polymer by atom
transfer radical polymerization and
25 (2) converting the terminal halogen of said polymer to a phenol
group-containing substituent group.
5. The heat-curable composition according to any of
Claims 1 to 4
30 wherein the (A) component vinyl polymer has its main
chain produced by polymerizing a (meth)acrylic monomer.
6. The heat-curable composition according to Claim 5
wherein the (meth)acrylic monomer is a (meth)acrylic
35 acid ester monomer.

7. The heat-curable composition according to Claim 6 wherein the (meth)acrylic acid ester monomer is an acrylic acid ester monomer.

5

8. The heat-curable composition according to any of Claims 1 to 4

wherein the (A) component vinyl polymer has its main chain produced by polymerizing a styrenic monomer.

10

9. The heat-curable composition according to any of Claims 1 to 8

wherein the (A) component vinyl polymer has a ratio (Mw/Mn) of weight average molecular weight (Mw) and number average molecular weight (Mn) as measured by gel permeation chromatography of less than 1.8.

10. The heat-curable composition according to any of Claims 1 to 9

wherein the (A) component vinyl polymer has a number average molecular weight of 500 to 100,000.

11. A shaped article as obtainable by curing the heat-curable composition according to any of Claims 1 to 10.

12. A polymer as obtainable by reacting (A) a vinyl polymer having at least one phenol group at the main chain terminus with (C) an aldehyde compound.

13. The polymer according to Claim 12 wherein the (A) component vinyl polymer has its main chain produced by the living radical polymerization of a vinyl monomer.

14. The polymer according to Claim 12 or 13
wherein the (A) component vinyl polymer has its main chain
produced by the atom transfer radical polymerization of a vinyl
5 monomer.

15. The polymer according to any of Claims 12 to 14
wherein the (A) component vinyl polymer is obtainable by
the procedure comprising
10 (1) producing a halogen-terminated vinyl polymer by atom
transfer radical polymerization and
(2) converting the terminal halogen of said polymer to a phenol
group-containing substituent group.

15 16. The polymer according to any of Claims 12 to 15
wherein the (A) component vinyl polymer has its main chain
produced by polymerizing a (meth)acrylic monomer.

20 17. The polymer according to Claim 16
wherein the (meth)acrylic monomer is a (meth)acrylic acid
ester monomer.

18. The polymer according to Claim 17
wherein the (meth)acrylic acid ester monomer is an
25 acrylic acid ester monomer.

19. The polymer according to any of Claims 12 to 15
wherein the (A) component vinyl polymer has its main chain
produced by polymerizing a styrenic monomer.

30 20. The polymer according to any of Claims 12 to 19
wherein the (A) component vinyl polymer has a ratio
(Mw/Mn) of weight average molecular weight (Mw) and number
average molecular weight (Mn) as measured by gel permeation
35 chromatography of less than 1.8.

21. The polymer according to any of Claims 12 to 20 wherein the (A) component vinyl polymer has a number average molecular weight of 500 to 100,000.

5

22. The polymer according to any of Claims 12 to 21 wherein the aldehyde compound (C) is at least one member selected from the group consisting of formaldehyde, hexamethylenetetramine, paraformaldehyde, furfural, acetaldehyde and salicylaldehyde.

10

23. A heat-curable composition comprising the polymer according to any of Claims 12 to 22.

15

24. A shaped article as obtainable by curing the heat-curable composition according to Claim 23.

20

25. A heat-curable composition comprising (A) a vinyl polymer having at least one phenol group at the main chain terminus, (B) a phenol resin and (C) an aldehyde compound.

TOP SECRET